PB88-185723

Superfund Record of Decision (EPA Region 7)
Minker/Stout/Romaine Creek - Stout Portion
Missouri (Third Remedial Action), September 1987

(U.S.) Environmental Protection Agency
Washington, DC

28 Sep 87

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EPA

Superfund Record of Decision:

Minker Stout/Stout, MO

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Stout portion of the Minker/Stout/Romaine Creek site is located on West Swaller Road near Imperial, Missouri, approximately 20 miles southwest of St. Louis. The Stout portion consists of five private properties, three of which have been purchased by EPA as part of a permanent relocation of area residents. In the late 1960s and early 1970s, a southwest Missouri chemical plant producing 2,4,5-T and hexachlorophene contracted a waste oil reclaimer to remove process residues. These residues, contaminated with 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), were mixed with waste oils and sprayed as a dust suppressant on a nearby horse arena. In March of 1983, the horse arena owner had the contaminated soils removed to various portions of the Minker/Stout/Romaine Creek site. Approximately 700 yd^3 of this soil was used as fill in the Stout area, near two mobile home pads. In 1982, EPA sampling revealed high concentrations of TCDD in onsite soils. Later that year, three of the five properties making up the Stout portion were purchased by EPA and the residents were permanently relocated. No removal of contaminated soil has been performed to date. The primary contaminant of concern is dioxin.

The selected interim remedial measure for the Stout portion of this site includes: excavation and temporary onsite storage of soils contaminated with greater than 1 ug/kg TCDD (interim storage will be utilized until a final dioxin management option can be

(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Minker/Stout/Romaine Creek - Stout Portion, MO Third Remedial Action Contaminated Media: soil Key contaminants: dioxin		

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Third Remedial Action

16. ABSTRACT (continued)

selected); and backfilling and revegetation of the excavated areas with clean materials. The estimated present worth cost for this remedial action is $5,817,000 - $7,018,000 with annual O&M of $6,000.

Record of Decision
Operable Unit Remedial Alternative Selection

SITE: Stout Portion of Minker/Stout/Romaine Creek NPL Site

DOCUMENTS REVIEWED

I am basing my decision primarily on the following documents describing the analysis of cost-effectiveness of operable unit remedial alternatives for interim management of dioxin-contaminated materials at the Stout portion of the Minker/Stout/Romaine Creek NPL site. Additional documents considered are included in the Administrative Record for this action.

- Operable Unit Feasibility Study - Stout Portion of the Minker/Stout/Romaine Creek Site, July 8, 1987.
- Summary of Remedial Alternative Selection - Stout Portion of the Minker/Stout/Romaine Creek Site.
- Responsiveness Summary - Operable Unit Remedial Actions for the Stout and Romaine Creek portions of the Minker/Stout/Romaine Creek Site.
- Federal Position Statement on Dioxin in Missouri, Centers for Disease Control, December 7, 1982.
- Public Health Advisory for the Minker/Stout Sites, Centers for Disease Control, March 17, 1983.
- Addendum to March 17 "Public Health Advisory for the Minker/Stout Sites," Centers for Disease Control, April 7, 1983.
- Health Implications of 2,3,7,8-tetrachlorodibenzodioxin (TCDD) Contamination of Residential Soil, Kimbrough, R.D., et al., Journal of Toxicity and Environmental Health, 14:47-93, 1984.

DESCRIPTION OF SELECTED REMEDY

The selected operable unit remedial action alternative involves the excavation of soil at the Stout area contaminated with 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD) at levels exceeding one part per billion (1 ppb). Contaminated materials will be excavated until a residual TCDD concentration of less than 1 ppb remains. Excavation will not continue beyond a depth of four feet, or once solid bedrock is encountered. Excavated materials will be containerized and placed in temporary onsite storage until a final management alternative is implemented. Storage structures for the excavated material will be constructed on the former Edwards property adjacent to Romaine Creek. The Baczynski property on West Swaller Road will be considered only as a contingency storage location if an adequate amount of suitable land does not exist on the former Edwards property for storage of contaminated materials from the Stout area and Romaine Creek. The storage structures will be designed and constructed in accordance with the substantive requirements for hazardous waste storage facilities under the Resource Conservation and Recovery Act, as amended. Following removal of contaminated

material from the Stout area, excavated areas will be backfilled to original grade with clean material and revegetated.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that excavation and interim onsite storage of TCDD-contaminated materials at the Stout portion of the Minker/Stout/Romaine Creek site is cost-effective, consistent with a permanent remedy, and provides adequate protection of public health, welfare, and the environment. The remedy selection procedure and selected alternative comply with provisions of the Superfund Amendments and Reauthorization Act of 1986. The State of Missouri has been consulted and concurs with the selected remedy.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. The selected operable unit remedial alternative is consistent with Section 300.68(c) of the National Contingency Plan and is a component of a total remedial action which will attain all applicable or relevant and appropriate requirements for the protection of public health and environment.

9-28-87
Date

Regional Administrator

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
STOUT PORTION OF THE MINKER/STOUT/ROMAINE CREEK SITE
JEFFERSON COUNTY, MISSOURI

The purpose of this document is to state the interim remedy that the Environmental Protection Agency (EPA) has selected to implement at the Stout portion of the Minker/Stout/ Romaine Creek site. This document will also include a brief analysis of remedial action alternatives which have been evaluated leading to the Agency's decision of remedy preference.

An operable unit is defined as a discrete part of an entire response action for an uncontrolled hazardous waste site which functions to decrease a release, threat of release, or pathway of exposure of hazardous substances. Operable units must be consistent with the final remedy for a site and must be cost-effective according to the provisions of SARA. It is assumed in this document that the final remedial action at the Stout area will involve offsite management, which will require eventual excavation of contaminated soil and sediments.

SITE DESCRIPTION

The Stout portion of the Minker/Stout/Romaine Creek hazardous waste site is located in Jefferson County, Missouri, approximately 20 miles southwest of St. Louis. The Stout area is on West Swaller Road near the top of a steeply sloping hillside in an unincorporated, low-density residential area near Imperial, Missouri.

The Stout area is composed of five properties: the Vogt property, the Sutton property, and the former Hutchinson, Cisco, and Baczynski properties. These properties are collectively referred to as the Stout area because the TCDD-contaminated fill was originally placed at the site by a local contractor of that name. The Hutchinson, Cisco, and Baczynski properties have been purchased during a permanent relocation implemented in 1983. There are unoccupied residences on the former Hutchinson, Cisco, and Baczynski properties.

An unnamed intermittent creek lies at the bottom of the slope below the Stout area. This creek is approximately 1/2-mile-long and flows primarily during periods of heavy precipitation and runoff. It drains into Rock Creek, a minor tributary of the Mississippi River.

The contamination occurs on most of the Sutton property and on those portions of the Vogt and Hutchinson properties that are immediately adjacent to the Sutton property. A fill area is located on the Sutton property which provides a level surface for two mobile home pads. Due to the detection of contamination at depth, it was initially speculated that the contaminated soil was used with other soil for construction of the fill area, and that the contamination was potentially distributed throughout the fill. Subsequent investigations have suggested, however, that the mobile home pads were in place at the time the contaminated soil was brought to the Stout area. This would limit the contamination to surficial soils and result in a reduced volume of material requiring remediation.

SITE HISTORY

The Minker/Stout/Romaine Creek site was placed on the Environmental Protection Agency's National Priorities List (NPL) of uncontrolled hazardous waste sites in 1983 because 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD) was detected in the soil at concentrations exceeding a level of concern for the protection of public health. A historical investigation of the situation indicated the contaminants originated from a chemical plant in southwest Missouri, which produced hexachlorophene and 2,4,5-T in the late 1960's and early 1970's.

In 1971, a Missouri waste oil reclaimer was contracted to remove process residues contaminated with TCDD from a tank located at the southwest Missouri plant. This material was subsequently mixed with waste oil and sprayed as a dust suppressant on the Bubbling Springs Horse Arena near Imperial, Missouri. In March of 1973, the horse arena owner contracted with a local hauler for the removal of the contaminated soil from the arena. The arena was excavated and material was deposited at several locations which now constitute the individual portions of the Minker/Stout/Romaine Creek site. Approximately 700 cubic yards of this excavated soil were deposited at the Stout area near the two mobile home pads.

Previous investigations of contamination at the Stout area have consisted of soil sampling in May, October, and November 1982, February through May 1983, and March 1986. Analysis of samples for priority pollutants and TCDD has indicated that other contaminants are not present at levels of concern, and that TCDD is present at levels requiring remediation to assure protection of human health and the environment.

Initial sampling in May 1982 detected TCDD concentrations up to 21 ppb. The sampling performed in October and November of 1982 involved collection of samples at various depths up to 20 feet. Detected TCDD concentrations ranged up to 22.2 ppb. One sample showed a level of 5.8 ppb at a depth of 20 feet; subsurface contamination was only detected in one of nine boring locations, however, so the vertical distribution of contamination remains uncertain. It has been the Agency's experience since the collection of these samples that cross contamination can result in a false indication of contamination at depth in soil core samples unless special precautions are taken.

In February and March 1983, samples were collected from a 20-foot grid pattern over the fill area. Contaminant levels as high as 241 ppb were detected. This sampling also indicated that contamination had migrated into the unnamed tributary to Rock Creek below the Stout area.

In April and May of 1983, extensive sampling was performed in the vicinity of the Stout area. This sampling confirmed that contamination was limited to the Stout area and approximately 800 feet along the unnamed intermittent stream. TCDD concentrations exceeding 1 ppb in the intermittent stream have been detected only directly below the Stout area. A maximum TCDD concentration of 11 ppb has been detected in this portion of the stream. TCDD concentrations in the stream are reduced to less than 1 ppb within 100 feet downgradient of this area.

In March 1986, the Stout area was sampled using a statistically-based procedure which determined the maximum expected TCDD concentration within discrete areas of the site to the 95 percent confidence level. This procedure has been reviewed and approved by federal and state health and environmental agencies and has been utilized since 1984 during removal actions involving the cleanup of TCDD-contaminated soil at sites in Missouri. The areal extent of contamination exceeding 1 ppb which was determined by this procedure is approximately 1.1 acres immediately surrounding the mobile home pads north of West Swaller Road and areas immediately downgradient.

Remedial actions performed to date at the Stout area have involved the permanent relocation of three residences following discovery of TCDD contamination in 1982. These three properties were purchased using CERCLA remedial authority and funding. Titles to the properties have been transferred to the State of Missouri. A fence was constructed around the contaminated portion of the area in 1987 to restrict access to contaminated soils. No removal of contaminated soil has been performed to date.

COMMUNITY RELATIONS HISTORY

Section 117 of SARA provides that notice must be published and a brief analysis of the proposed plan be made available to the public. A reasonable opportunity for submission of oral and written comments must be provided. The opportunity for a public meeting near the site is required regarding the proposed plan. Any findings concerning compliance with federal and state cleanup standards must be provided to the public.

A public comment period for the Stout Operable Unit Feasibility Study (OUFS) and Proposed Plan was held from August 20 through September 21, 1987. A public meeting was conducted on September 10, 1987, to discuss these documents and the Agency's tentatively selected alternative.

All released documents were made available for public inspection and copying at EPA Public Information Centers located on Lewis Road, immediately east of Times Beach, and at the intersection of Kiefer Creek Road and Ries Road in Castlewood (Ballwin), Missouri. An onsite EPA public information center will be established and remain open during implementation of remedial action at the Stout area. This information center will remain open until onsite activities are completed. These EPA information facilities provide the opportunity for public access to information 6 days a week.

The opportunity for public participation has been provided prior to and during all dioxin cleanup activities in Missouri since EPA began actively investigating potential Missouri dioxin sites in 1982. Cleanup activities at several Missouri dioxin sites to date have consisted of removal actions taken to reduce exposure to dioxin-contaminated soils by containment and by excavation and secure storage. Public meetings have been conducted prior to all removal activities implemented since 1984 to solicit public comments so that the Agency could be aware of and responsive to the public's concerns.

Cleanup measures being addressed in this document represent interim actions for the management of dioxin-contaminated soils prior to final management. Final management of dioxin-contaminated materials is being addressed separately, and was evaluated in the Feasibility Study of Final Remedial Actions for the Minker/Stout/Romaine Creek Site.

A public comment period was held for the Feasibility Study of Final Remedial Actions for the Minker/Stout/Romaine Creek Site from August 8, 1986, until September 5, 1986. A public hearing was held on August 25, 1986, at a local public facility in order to discuss the alternatives evaluated in the study and the Agency's proposed remedy. At the public meeting it was announced that the only alternative in the study which the Agency currently considered feasible for final management of contaminated soils was offsite thermal treatment within 50 miles of the site. It was also announced that the State of Missouri had recommended and suggested the evaluation of Times Beach as a possible location for siting a mobile thermal destruction unit. It was announced that a feasibility study to evaluate Times Beach as a potential location for offsite thermal treatment would be completed and released for public comment in January 1987.

ALTERNATIVES EVALUATION

SITE OBJECTIVES

General site-specific objectives are 1) to prevent or reduce long-term human contact with soils containing dioxin at concentrations exceeding the action level which is determined to be protective of public health and the environment, 2) to minimize the potential for offsite migration of dioxin. Operable unit alternatives must be consistent with the final remedial action. An objective of all alternatives involving treatment is to achieve destruction and removal efficiencies (DRE's) which meet applicable or relevant and appropriate regulatory criteria.

The Stout Operable Unit Feasibility Study evaluated removal of soil and sediment exceeding an action level of 1 ppb. Federal and state health officials have determined that 1 ppb in a residential area is a reasonable level at which to express concern about public health risks. Complete removal of the entire fill supporting the mobile home pads was also evaluated.

DESCRIPTION OF ALTERNATIVES

A brief description of the operable unit alternatives is given in this section. Five alternatives have been given consideration for the interim remedy proposed for the Stout area. Additional development, description, and evaluation of each alternative is presented in the Stout OUFS.

Alternative 1: No Action

Under the no-action alternative, no additional remedial actions would be taken at the Stout area.

Alternative 2: Limited Action

Limited action would involve implementation of site use restrictions, as deemed necessary, seeding sparsely vegetated or unvegetated areas, and providing surface water controls and annual monitoring.

Alternative 3: Stabilization

Tnis alternative would include the same scope items as described for Alternative 2 plus the additional measures of quarterly monitoring and in-place stabilization of the sediments contaminated at levels greater than 1 ppb. Stabilization would be accomplished by installing a porous mat over the ground surface and promoting the growth of vegetation into and through the mat by seeding and fertilization.

Alternative 4: Excavation to 1 ppb and Storage

Alternative 4 would involve excavation and temporary onsite storage of soils contaminated at concentrations exceeding 1 ppb to a maximum depth of 4 feet or bedrock. It is estimated that 3,500 to 5,700 cubic yards would be excavated and stored if this alternative were implemented. It is assumed that the excavated soils would be stored in semibulk sacks placed in metal buildings, as has been done by the EPA during removal actions performed at other Missouri dioxin sites. The OUFS assumed that excavated soil would be placed in interim storage inside fully enclosed steel storage structures located on the former Baczynski property, which is now state-owned.

Alternative 5: Complete Excavation and Storage

Alternative 5 would involve excavation and temporary onsite storage of the entire Stout fill area. It is estimated that the volume of soil which would require storage if this alternative were implemented would range from 4,000 to 8,750 cubic yards. Storage would be as described for Alternative 4. Sufficient space may not exist at the former Baczynski property for interim storage of all excavated material. The former Edwards property, now state-owned, was identified in the OUFS as a possible contingency storage location. The former Edwards property is a portion of the Minker/Stout/Romaine Creek site located adjacent to Romaine Creek near the Minker area.

EVALUATION OF ALTERNATIVES

The five operable unit alternatives considered in the detailed evaluation were compared to CERCLA criteria for the selection of remedy. These remedy selection criteria include the following:

- Compliance with ARARs
- Reduction of mobility, toxicity, or volume of waste
- Short-term effectiveness
- Long-term effectiveness
- Permanence
- Implementability
- Cost
- Community and state acceptance

Table 1 presents an evaluation of each alternative against these evaluation criteria. A discussion of each criteria and their attainment by each of the alternatives follows:

Compliance with ARARs

Section 121(d) of CERCLA, as amended by SARA, requires that remedial actions comply with requirements or standards under federal and state laws for the protection of public health and the environment. Section 121(d) allows a remedy to be selected that does not attain a level of control at least equivalent to a legally applicable or relevant and appropriate requirement (ARAR) if the remedy selected is only part of a total remedial action that will attain such a level of control when completed. The operable unit alternatives evaluated in the feasibility study represent only part of the complete remedy for the Stout area. It is not necessary for these alternatives to comply with all ARARs. The alternatives will, however, be compared to ARARs and evaluated to determine the extent to which each is consistent with a final remedy which attains ARARs.

All alternatives evaluated are consistent with final remedial actions which involve treatment or disposal. A complete remedy involving the treatment or disposal of dioxin-contaminated soils could potentially meet all ARARs. The operable units evaluated are therefore consistent with complete remedies which meet ARARs.

The land ban regulations governing the land disposal of dioxin-contaminated wastes are expected to go into effect in November 1988. Final disposal of soils from the Stout area is not expected to occur before this date. The land ban regulations state that dioxin-contaminated soils can be land disposed if they pass the Toxicity Characteristics Leaching Procedure (TCLP). Based upon existing sample results from the Stout area, it is expected that the excavated sediments would pass the TCLP test and be exempt from the dioxin land ban.

Permits are not required for onsite remedial actions at Superfund sites. Although formal permits are not required, any action must meet the substantive technical requirements of the permit process. Storage structures included in alternatives involving excavation and interim onsite storage of contaminated soils will be designed and constructed in compliance with the substantive requirements of the Resource Conservation and Recovery Act, as amended (RCRA).

Reduction of Mobility, Toxicity, or Volume of Waste

Section 121(b) of CERCLA, as amended, states that remedial actions involving treatment which permanently and significantly reduces the volume, mobility, or toxicity of hazardous materials are to be preferred over those not involving such treatment. This evaluation criteria relates to the ability of a remedial alternative to control or eliminate risks caused by the mobility, toxicity, or volume of a hazardous waste.

TABLE 1. REMEDY SELECTION CRITERIA - STOUT

ALTERNATIVE	COMPLIANCE WITH ARARs	REDUCTION OF MOBILITY, TOXICITY, OR VOLUME OF WASTE	SHORT-TERM EFFECTIVENESS	LONG-TERM EFFECTIVENESS
1: No Action	Consistent with complete remedy which complies with ARARS.	No reduction of mobility, toxicity, or volume. Some increase in contaminated soil volume requiring future excavation may occur due to contaminant migration.	Risks to public health and the environment remain at current levels.	Existing contaminants would remain in place unless migration occurs. Risks to public health and the environment remain at current levels. Site boundaries may expand due to continued migration.
2: Limited Action	Consistent with complete remedy which complies with ARARS.	No reduction of mobility, toxicity, or volume. Some increase in contaminated soil volume requiring future excavation may occur due to contaminant migration.	Low potential for exposure to community or environment in excess of current levels or exposure to workers during implementation. Implementation could be performed in approximately 1 month.	Monitoring program would detect contaminant migration. Fencing would control access to existing contaminated soils. Low O&M requirements. Protection achieved immediately upon completion.
3: Stabilization	Consistent with complete remedy which complies with ARARS.	No reduction in toxicity. Volume of material requiring eventual excavation will increase due to volume of stabilization material. Mobility would be reduced and could be controlled with adequate maintenance.	Greater potential for exposure to workers and community relative to alt. 2 due to soil disturbance. Temporary disturbance of wildlife. Implementation could be performed in approximately 2 months.	Reduced potential for exposure to community and environment. Existing contaminants remain in place. Moderate O&M requirements to maintain vegetation. Reliability of vegetative cover uncertain. Vegetation may be difficult to maintain.
4: Partial Excavation	Consistent with complete remedy which complies with ARARS. Storage structures designed and constructed to RCRA standards.	No reduction in toxicity. Mobility controlled by containerization and secure storage. Volume of contaminated soil fixed at current level. Estimated 3,500-5,700 cy of material would require final management.	Increased potential for exposure to workers and community due to soil disturbance. Temporary disturbance of wildlife. Implementation could be performed in approximately 4-6 months.	Exposure potential reduced to residential standards. Soil TCDD levels permanently reduced to less than 1 ppb. Potential bioaccumulation adequately reduced. Protection achieved immediately upon completion. Limited O&M requirements for structures.
5: Complete Excavation	Consistent with complete remedy which complies with ARARS Storage structures designed and constructed to RCRA standards.	No reduction in toxicity. Mobility controlled by containerization and secure storage. Volume of contaminated soil fixed at current level. Estimated 4,000-8,750 cy of material would require final management.	Increased potential for exposure to workers and community due to soil disturbance. Temporary disturbance of wildlife. Implementation could be performed in approximately 4-6 months.	Exposure potential for community and environment eliminated. No residual contamination would remain. Potential bioaccumulation eliminated. Protection immediate upon completion. Limited O&M requirements for storage structures.

TABLE 1. REMEDY SELECTION CRITERIA - STOUT (cont.)

ALTERNATIVE	PERMANENCE	IMPLEMENTABILITY	COST	COMMUNITY AND STATE ACCEPTANCE
1: No Action	No direct impact on future management requirements. Volume of material requiring final management may increase or decrease due to contaminant migration.	n/a	Total present worth: $0 Annual O&M cost: $0	Community desires that Stout area be cleaned up as soon as possible. State recognizes need to initiate action. Fencing may be objectionable to community from asthetic standpoint. Would not satisfy state and community.
2: Limited Action	No direct impact on future management requirements. Volume of material requiring final management may increase or decrease due to contaminant migration.	Straightforward implementation. Uncertain reliability due to unauthorized site intruders. Access to affected private property would be required.	Total present worth: $159,000 Annual O&M cost: $12,000	Community may interpret as final action. Fencing may be objectionable to community from asthetic standpoint. Limited Action not consistent with past state actions.
3: Stabilization	Does not represent permanent fixation. Regular maintenance would be required to maintain the volume of soil requiring final management at current level. Increase in total volume due to stabilization materials.	Maintenance of vegetation may be difficult in some areas. Erosion may occur during severe storms. Access to private property would be required.	Total present worth: $571,000 Annual O&M cost: $22,000	Community may interpret as final action, and would object to need to access property and disturb soils twice. Not consistent with past state actions.
Partial Excavation	Permanent reduction in surface soil TCDD levels to below 1 ppb. Containerization would facilitate future handling.	Implementation facilitated by proper selection of equipment. Reliability of storage structures high. Access to private property would be required.	Total present worth: $5,817,000 - 7,018,000 Annual O&M cost: $6,000	Community would support removal of contaminated soils, but may object to siting of storage structures. Consistent with past state actions.
mplete Excavation	Permanently remove existing contamination to background levels. Containerization would facilitate future handling.	Overexcavation may occur due to difficulty in detecting native soil. Access to private property required. Reliability of storage structures high. Potentially lack onsite area for required structures.	Total present worth: $5,682,000 - 7,687,000 Annual O&M cost: $6,000 - 12,000	Community would support removal of contaminated soils, but may object to siting of storage structures. Large number of structures potentially required objectionable. Consistent with past state actions.

Alternative 1, No Action, would have no direct impact on the mobility, toxicity, or volume of hazardous materials in the Stout area. However, failure to stabilize or contain dioxin-contaminated soils may expand site boundaries due to contaminant migration, resulting in an increased soil volume requiring final management. Toxicity of the existing contamination would remain at current levels for all alternatives, prior to final management.

Implementation of the limited-action alternative would reduce the mobility of the contamination somewhat by enhancing existing vegetation. The volume of hazardous materials requiring management could potentially increase due to migration.

Stabilization of contaminated areas would reduce the potential for erosion and transport to a greater extent than limited action. Implementation of this alternative would result in an increase in the soil volume requiring final management due to the volume of stabilization material.

Alternatives involving the excavation and interim onsite storage of contaminated soils would result in a substantially decreased potential for migration. Mobility of excavated material would be eliminated due to containerization and secure storage. Migration of soils containing TCDD below the action level of 1 ppb could continue to occur, but would not be expected to result in TCDD exposure above a level of concern for public health and the environment. It is anticipated that no additional excavation would be necessary to maintain surface soil concentrations below 1 ppb. Complete excavation of the entire fill area would remove all potentially contaminated soil from the Stout area, eliminating any potential for additional migration of existing contamination. Excavation alternatives would fix the soil volume requiring final management at current levels.

Short-Term Effectiveness

Short-term effectiveness measures how well an alternative provides protection of the environment, community, and workers during construction, and the time required for implementation.

Short-term risk to public health and the environment would remain at current levels for Alternative 1. However, there would be no increase in risk to workers or the public due to construction activity or disturbance of contaminated soil. During implementation of Alternative 2, there would be low potential for exposure to workers, but no increased exposure potential to the community or environment Stabilization of the creek bed would result in greater potential for worker exposure due to increased opportunity for contact with contaminated soils during implementation. Soil disturbance would increase the potential for exposure to the community through erosion by water and wind, and could temporarily disturb wildlife.

Excavation and interim storage of contaminated soil would also involve soil disturbance and related exposure opportunities. This exposure potential could be controlled by application of dust suppressants and monitoring.

Severe storms may spread contamination during implementation of stabilization or excavation activities. The spread of contamination due to precipitation could be controlled by placement of a daily cover over exposed areas. Complete excavation of the entire area would involve a somewnat larger area with greater opportunity for wildlife disturbance and community and worker exposure.

Long-Term Effectiveness

Long-term effectiveness addresses the long-term protection and reliability that an alternative affords. This includes the risk to the community once the remedy is in place, risk to workers during operation and maintenance (O&M), environmental risk due to residual hazardous substances, long-term reliability, O&M requirements, time required to achieve protection, and the difficulty in detecting and mitigating problems with the completed remedy.

Existing contamination would remain in place and unmanaged for the no-action and limited-action alternatives. Site boundaries could potentially expand due to contaminant migration through erosion. If this occurred, the resulting increased volume of contaminated sediment would increase the scope and cost of future management.

Limited action would provide a monitoring program to detect the spread of contamination, and fencing to control access to contaminated areas. Fencing and posting may not prevent all site intruders from access. Limited action would have low O&M requirements, could be easily inspected, and repairs would be straightforward. Limited action would achieve its full degree of protection immediately upon implementation of the remedy, as would all of the alternatives evaluated.

Stabilization of the fill area could reduce exposure potential to the community and environment by controlling dispersion of contaminated soil due to erosion by wind and water. Existing levels of contamination would remain in place. The potential for bioaccumulation would continue to exist at a reduced rate. Operation and maintenance requirements may be significant in order to maintain year-round vegetation in all contaminated portions of the fill area. Quarterly O&M may not be sufficient to maintain vegetation in some areas. Workers performing routine O&M could potentially be exposed to elevated TCDD levels. Ineffectiveness of the stabilization could result in the migration of contaminants which could expand site boundaries and increase the soil volume requiring final management.

Excavation of contaminated sediment exceeding 1 ppb would reduce community exposure potential to residential standards. Potential bioaccumulation of TCDD in biota would be possible if levels below 1 ppb remain in place, but would be expected to be substantially reduced from current levels. Potential bioaccumulation of dioxin in biota does not represent a significant risk to human health, however, since contaminated biota are not expected to enter the human food chain, due to the fact that surveys have shown that no recreational or commercial harvesting of indigenous species takes place in this area.

Limited O&M requirements would be associated with maintaining the storage structures for both excavation alternatives. There would be no O&M requirements for the excavated fill area. Problems with the remedy could easily be detected during inspection of the storage structures and repaired. The risk of system failure is very low.

Excavation and interim onsite storage of the entire fill area would provide the maximum degree of long-term protection to public health and the environment of the alternatives evaluated. No residual contamination would remain in the fill. Exposure potential for the community and environment and the potential for bioaccumulation in the creek would be eliminated. Limited O&M requirements would be associated with the storage structures. Problems with the remedy could be easily detected during inspection and repaired.

Permanence

The criteria of permanence is similar to long-term effectiveness, but with an emphasis on the need for management of treated residuals and untreated wastes. The operable unit alternatives evaluated represent interim measures which can be implemented prior to final management of the contaminated soils. Permanence of each operable unit alternative concerns the extent to which future management of contaminated soils will be necessary.

Implementation of the no-action and limited-action alternatives will have no direct impact on future management requirements, although the volume of soil requiring final management could either decrease or increase due to migration of contamination.

Stabilization would be effective at controlling migration of contaminated soil, thereby fixing the volume of soil contaminated in excess of 1 ppb at the current level. There would be some increase in future management requirements due to the need to manage the stabilization materials.

Partial excavation of sediment would result in the permanent reduction of in-place contaminated levels to below 1 ppb. The volume of soil requiring future management would be fixed at the current level. Future handling of soils would be facilitated due to containerization of wastes. Partial excavation of the fill could potentially remove all contamination if contaminated soil is limited to the surface. Complete excavation of contaminated soils would permanently remove all existing contamination from the fill area, fixing the volume of material to be managed in the future and facilitate future handling.

Implementability

This criteria measures the technical difficulties, reliability, and availability of each alternative. Implementability also involves the administrative feasibility of each alternative. No permits would be required for any of the actions evaluated since CERCLA onsite actions are exempt from permitting requirements by law.

The implementability criteria does not apply to the no-action alternative, since no measures would be taken to mitigate the contamination. Implementation of limited action would be straightforward. The reliability of the limited-action alternative is not certain. Site intruders could ignore warning signs and scale fences. Contamination may migrate downgradient resulting in additional areas requiring access restrictions. Implementation of stabilization technologies would be straightforward. The reliability of stabilization may be impacted by severe storms which could disrupt the stabilized areas.

Implementation of the partial excavation alternative could be facilitated by appropriate construction techniques. A combination of conventional excavation equipment and vacuum equipment could be used to efficiently remove lifts of soil from the fill without recontaminating the area. The reliability of partial excavation would be very high upon completion. The storage structures would last indefinitely if properly maintained. Implementation of the complete excavation alternative would be straightforward, although it may be difficult to determine the point at which native soil is encountered, which could result in overexcavation and substantial sampling requirements. Removal actions involving excavation and interim onsite storage of TCDD-contaminated soils have been successfully implemented at several nearby sites in eastern Missouri.

Cost

The total present worth cost of each alternative is presented in Table I. Costs listed for Alternatives 4 and 5 involving excavation and interim storage include the cost of removal and decontamination of the storage structures upon implementation of final management. Also included in Table I is the estimated annual Operation and Maintenance (O&M) cost associated with each alternative.

Community and State Acceptance

During past public meetings conducted for other portions of the Minker/Stout/ Romaine Creek site and other nearby dioxin sites, the community was given the opportunity to express their preference for management of contaminated soils. Affected residents are in general agreement that the contaminated soil should be excavated and transported offsite for treatment or disposal. At the present time, there is no offsite treatment or disposal facility capable of receiving the dioxin-contaminated soils. Interim storage is therefore necessary until an offsite management option develops. The community is likely to be supportive of excavation of contaminated soil and removal of the associated risk to public health. Given the absence of an offsite management option, the public will probably accept interim storage as the only alternative available at this time. Interim storage is consistent with the community supported final management option of offsite treatment or disposal. Some local objection can be expected near the location where the required storage structures are sited.

Several removal actions have been completed in the recent past involving excavation and interim storage of contaminated soils at nearby eastern

Missouri dioxin sites. The State of Missouri has in the past been supportive of these actions if they achieve adequate protection of public health and the environment. The state has indicated its support for excavation and interim storage of soils exceeding 1 ppb at the Stout area.

SELECTED REMEDY

DESCRIPTION OF THE SELECTED REMEDY

The interim remedy which the Agency has selected to implement as an operable unit remedial action involves excavation of soils exceeding 1 ppb TCDD to a maximum depth of 4 feet or bedrock. Excavated areas would be backfilled to original grade with clean material and revegetated. This remedy is developed and described in detail as Alternative 4 in the Stout Operable Unit Feasibility Study.

Excavation of contaminated soil exceeding 1 ppb at the Stout area will be performed using conventional earthmoving and vacuum equipment, or other appropriate means of efficiently removing lifts of soil, thereby minimizing the potential for recontamination. An effort will be made to minimize the amount of material removed from the Stout area, while maintaining the assurance that soils exceeding 1 ppb are not left in place. Minimizing the volume of soil removed from the Stout area reduces the required interim storage space and associated final management costs for the removed material. Any identified technology or procedure capable of reducing the amount of material removed from the Stout area will be investigated during the design phase.

All TCDD concentrations will be determined at the 95 percent confidence level using the procedure developed in 1984 for cleanup of other eastern Missouri dioxin sites. This procedure has undergone peer review and approval by federal and state health agencies including the Centers for Disease Control/ Center for Environmental Health, Environmental Protection Agency, Missouri Division of Health, and the Missouri Department of Natural Resources. This procedure determines the maximum expected surface contaminant level in unit areas of approximately 5,000 square feet at the 95 percent confidence level.

Excavated soil will be containerized in woven polypropylene, polyethylene-lined bulk handling sacks similar to those currently and previously in use at eastern Missouri dioxin removal locations, including Quail Run, Castlewood, and the Minker, Cashel, and Sullins portions of the Minker/Stout/Romaine Creek site. These bulk-handling sacks will be loaded by hopper and transported to fully-enclosed temporary storage structures constructed onsite. Storage structure design will be similar to those in use at other eastern Missouri dioxin sites. One 50-foot by 100-foot building has a capacity of approximately 1,100 cubic yards of containerized soil. It is estimated that four such structures will be required onsite to store the volume of contaminated material anticipated to be excavated from the Stout area.

Excavated materials will be placed in interim storage until a final management option can be selected. It will be initially attempted to store all material excavated from the Stout area in storage structures located on the former Edwards property, adjacent to Romaine Creek. If sufficient space does not exist on this property for storage of all removed material from Romaine Creek and the Stout area, the former Baczynski property on Swaller Road will be considered for a contingency storage location. The former Baczynski property will only be considered for storage in the event that available storage space at the former Edwards property is exhausted.

If a final management alternative becomes available and is selected in a separate Record of Decision for material removed from the Stout area, it is possible that interim storage of the excavated material will not be necessary, and that contaminated soil can be taken directly to the location where final management is available. This decision would be documented in a subsequent Record of Decision for final management of dioxin-contaminated materials from the Minker/Stout/Romaine Creek site.

RATIONALE FOR PREFERENCE

The selected interim remedy is preferred over the no-action and limited-action alternatives primarily because leaving contaminated soil in place does not provide adequate protection of human health or the environment.

The contaminated soil in the fill area is not currently being managed in a manner which is protective of human health and the environment. Contaminant migration could expand site boundaries to areas where access is not restricted by fencing. Exposure to nearby residents or visitors via direct contact and ingestion could occur in excess of a level of concern for protection of human health in residential areas recommended by federal and state health agencies. Stabilization of contaminated soils is not being proposed due to the uncertainty of successful implementation and high O&M requirements. Stabilization would also involve the future disruption of contaminated soils and disturbance of nearby residents an additional time for final management.

STATUTORY DETERMINATIONS

Removal and temporary onsite storage of soils exceeding 1 ppb in the Stout area is being selected because this alternative attains the objectives of the interim remedy and satisfies the remedy selection criteria. The selected operable unit remedial alternative is protective of human health and the environment, is compatable with potential final remedial actions, and is cost-effective. Protection of human health and the environment is provided by reducing the potential for human and environmental contact with contaminated soil and reducing the potential for continued erosion of contaminated soils. Contaminated soil is containerized and isolated in a secure storage facility, thereby eliminating the potential for human or environmental contact with TCDD concentrations exceeding 1 ppb. Some migration of soil left in place at concentrations less than 1 ppb may continue

to occur, but this migration is not expected to result in the development of contaminant levels exceeding a level of concern for public health. It is anticipated that natural degradation and erosion processes will result in the gradual reduction of contaminant levels to near background levels.

The selected interim remedy also attains the objective of compatibility with final remedies. The interim remedy is compatible with potential offsite treatment or disposal options. Future handling of the contaminated material will be facilitated by containerization. The interim remedy is not compatible with final remedial action alternatives involving in-place containment or treatment. In-place alternatives, however, do not compare favorably to offsite alternatives for final management of contaminated soil, and are not being proposed by the Agency.

Although a final remedy has not been selected for contaminated soils from the Minker/Stout/Romaine Creek site, the Agency has proposed offsite thermal treatment for final management of this material. This proposed final remedy satisfies the statutory preference under SARA for remedies which utilize treatment technologies resulting in the permanent reduction of toxicity, mobility, or volume of hazardous waste.

The selected remedy has been determined to be the most cost-effective operable unit alternative which provides protectiveness. Only the two removal alternatives evaluated will assure the continued protection of public health and the environment. Complete excavation of the entire fill area cannot be justified at the additional cost because both alternatives reduce surface TCDD concentrations below 1 ppb which assures protection of public health and the environment. The potential for bioaccumulation in wildlife is expected to decline following removal of soil exceeding 1 ppb. As residual concentrations are further reduced through natural processes, a corresponding decline in potential bioaccumulation is expected.